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Larch Casebearer in Western Larch Forests

By Robert E. Denton [1]

The larch casebearer (*Coleophora laricella* (Hbn.)), an insect of European origin, appeared in Massachusetts in 1886. Subsequently it spread westward throughout the range of tamarack (*Larix laricina* (Du Roi) K. Koch) as far as central Minnesota and western Ontario.

In 1957 the casebearer was discovered in western larch (*Larix occidentalis* Nutt.) forests around St. Maries, Idaho, approximately 1,700 miles from the last-reported infestations in Minnesota. How the insect was transported this far west is unknown. When the outbreak was discovered, visible defoliation covered 170 square miles southeast of Lake Coeur d'Alene. Population buildup and spread have been rapid; in 1963 the area of visible defoliation was nearly 2,000 square miles.

Also, the spread of casebearer beyond the area of visible defoliation increased greatly during this period. By 1960 the casebearer was present over most of the Idaho panhandle and northeastern Washington; it was first found in northwestern Montana in 1961. In 1963 the limits of natural dispersal encompassed more than 7,500 square miles. Natural dispersal occurs only in the moth stage.

Description

Larch casebearer moths are silvery to grayish brown with no conspicuous markings (fig. 1). Both wings are narrow and fringed with long, slender, hairlike scales. The wing expanse is about three-eighths of an inch.

Eggs are cinnamon colored and under magnification resemble inverted teacups or jelly molds. Each egg has 12 to 14 lateral ridges extending from apex to base (fig. 2).

The larva is about three-sixteenths inch long when fully grown and dark reddish brown with a black head and thoracic shield. It is seldom seen in its entirety because it remains mostly within a case, made from a section of a needle. Cases made from western larch needles by immature larvae are straw colored and rectangular, becoming light gray and cigar shaped at the time of pupation (fig. 3).

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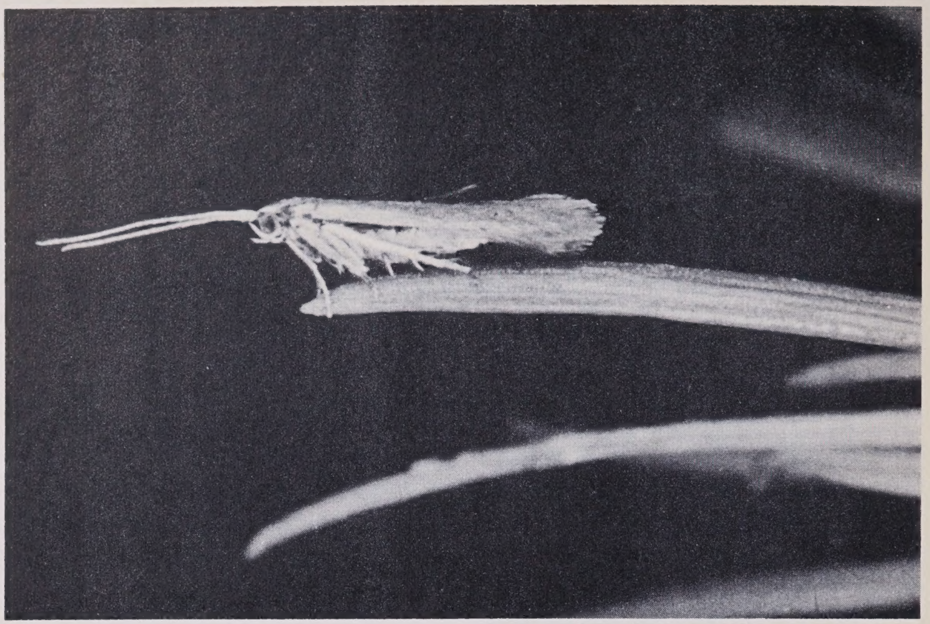

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Figure 1.—Larch casebearer moth in characteristic pose on a needle.

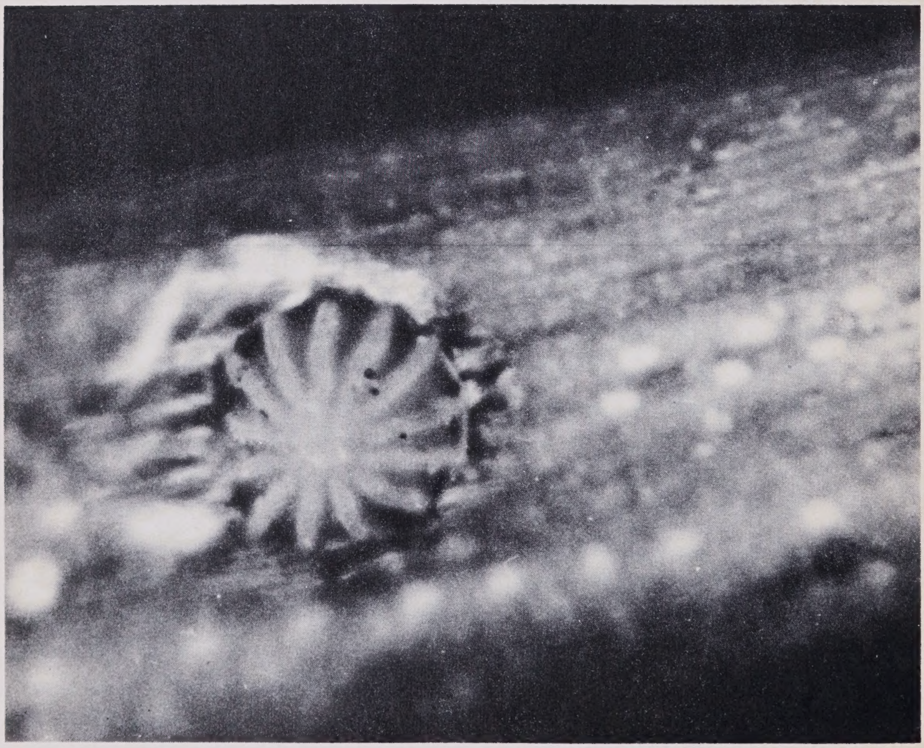

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Figure 2.—Larch casebearer egg.

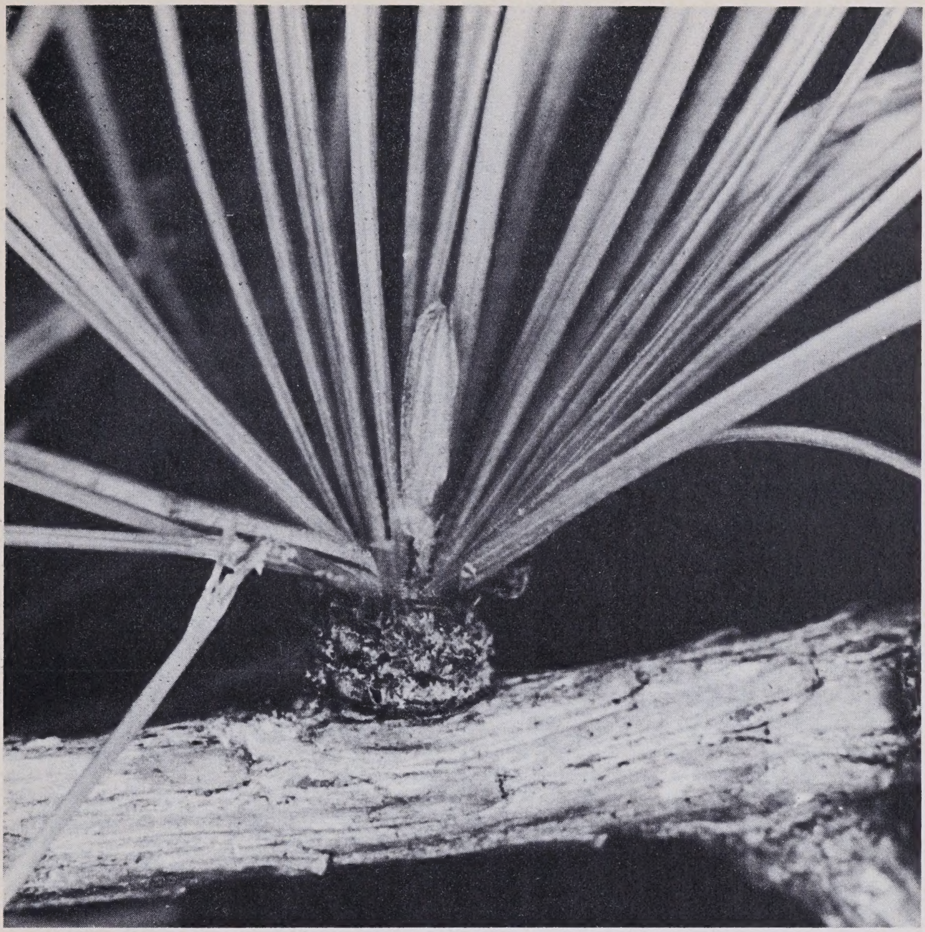

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Figure 3.—Larch casebearer pupal case attached in the center of a needle fascicle.

Life History

The larch casebearer produces one generation each year, the moths emerging from late May until early July. After mating, the female deposits about 50 eggs singly on the needles, usually on the undersurface.

Upon hatching, a larva bores directly into the needle through the bottom of the eggshell. It feeds for about 2 months as a miner within a needle. After hollowing the needle, the larva constructs a case by lining the inside of the mined section with silk. The case is then chewed free from the rest of the needle. Both ends of the case are open; the larva feeds from one end and pushes the frass out of the other.

In Idaho larvae are found feeding externally upon the foliage beginning in mid-August. The larva fastens its case firmly to a needle with a pad of silk and then mines the interior as far as it can reach without actually leaving the case. After mining one needle, the larva

chews its case free and moves on to another.

The casebearer overwinters as an immature, third-instar larva inside its case. As cold weather approaches in October, larvae leave the foliage and attach their cases securely by silk threads to the twigs. In a dense infestation, clusters of larvae hibernating in their cases may be found at the base of needle fascicles (fig. 4) after normal shedding of foliage.

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Figure 4.—Overwintering larvae in their cases attached to western larch twigs.

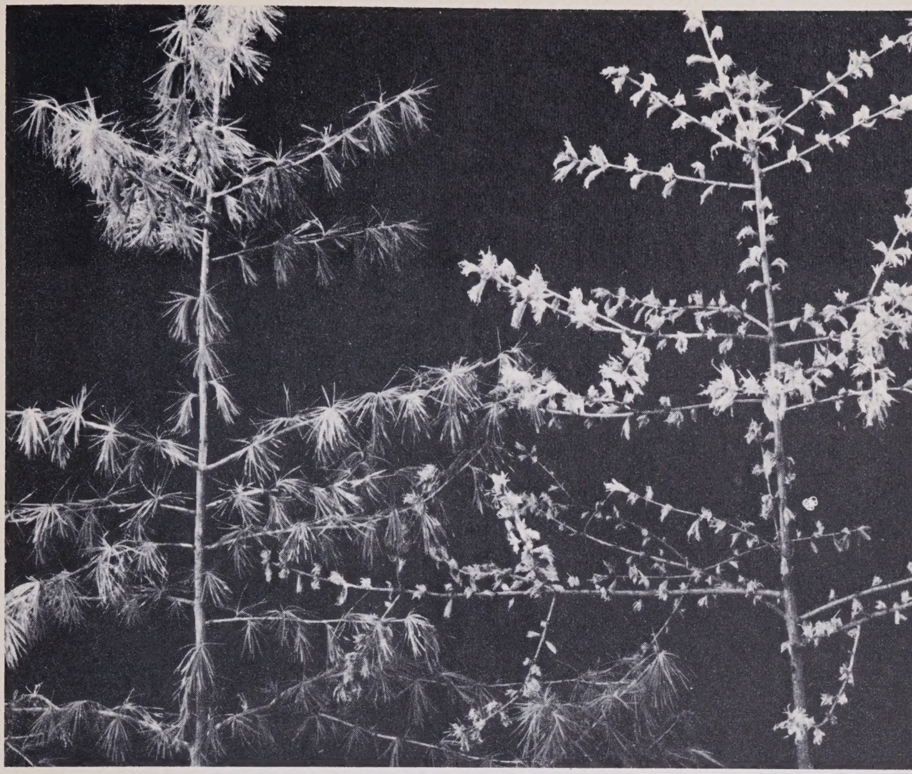

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Figure 5.—Young western larches: Undamaged foliage and foliage completely destroyed by larch casebearer feeding in the spring.

Larvae resume feeding in the spring concurrently with the appearance of new needles—about mid-April at lower elevations. There are four larval instars. Full growth is reached in late May, after which the larvae pupate inside their cases.

Damage

Damage results chiefly from the feeding of fourth-instar larvae on new foliage in early spring. In heavy infestations the foliage is destroyed as soon as it appears; as the needles dry out, the trees acquire a reddish-brown appearance as though scorched by fire (fig. 5).

Larch trees, being deciduous, are much more resistant to defoliation than are other coniferous trees, which cannot replace foliage. Because larch can produce two crops of needles during a growing season, it can withstand at least one defoliation per year for a number of years.

The larch casebearer's potential as a tree killer is unknown. No tree mortality has been observed, even in young western larch stands that have been severely defoliated for 7 consecutive years. However, these stands show a marked reduction in rate of growth. Increment core samples show a 50- to 60-per-

cent loss in radial growth in the 6-year period from 1957 to 1963.

Control

Natural control.—In Eastern States, at least 50 species of parasites are known to attack the larch casebearer; however, few natural control agents are active in western areas. A native chalcid, *Spilochalcis albifrons* (Walsh), is responsible for a small percentage of casebearer mortality, as is egg predation by other invertebrates. For this reason, considerable emphasis is being placed on establishing biological control by parasite introductions.

In 1960 several thousand adults of the braconid parasite, *Agathis pumila* (Ratz.), were imported from New England and liberated in heavily infested western larch stands in Idaho. Several specimens of *A. pumila* were recovered during mass rearings of larch casebearer larvae in 1962 and 1963. This means that the parasite has successfully completed three generations and apparently is becoming established in Idaho. However, because of the tremendous host populations considerable time will be required for *A. pumila* to build up to the point of significant control. It is believed that eventually this parasite will prove effective in checking the larch casebearer epidemic.

Applied control.—Direct control of the larch casebearer by aerial spraying is still in the experimental stage. Several insecticides, including such systemics as dimethoate, gave good results when applied in the spring before pupation. In tests, malathion caused nearly complete larch casebearer mortality at dosage rates as low as one-fourth pound in 1 gallon of fuel oil per acre.

The possibility of low-volume spraying is being explored. Technical-grade malathion, with no oil carrier, has been applied at dosage rates of one-half pint per acre. Tests against fall-feeding (second instar) and spring-feeding (fourth instar) larch casebearer populations proved very successful. However, more tests are necessary before dosage rates and techniques can be recommended.

Caution: If you use insecticides, apply them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. If insecticides are handled or applied improperly, or if unused portions are disposed of improperly, they may be injurious to humans, domestic animals, desirable plants, honey bees and other pollinating insects, fish, and wildlife. Also, they may contaminate water supplies.

Reference

The larch casebearer in Idaho—A new defoliator record for western forests. Robert E. Denton. U.S. Forest Serv. Intermountain Forest and Range Expt. Sta. Res. Note 51, 6 pp., illus. 1958.

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